A SIMPLE MICRO-VIEWING APPARATUS

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The micro-viewing apparatus described in this paper was devised to facilitate the histological analysis of food habits material collected from the cottontail rabbit, *Sylvilagus floridanus mearnsi*. In this food habits research the fecal pellets

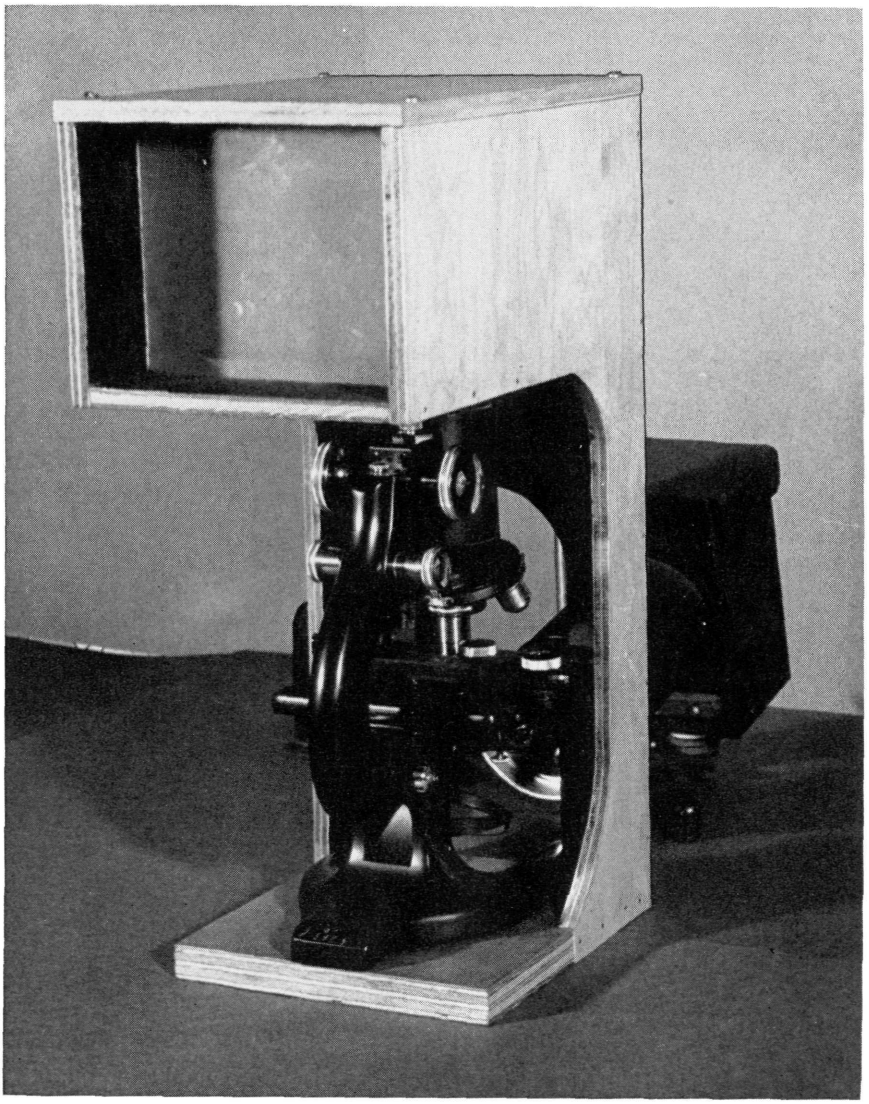

FIGURE 1. The Micro-viewer.

[1]This research was done while the writer was a research fellow of the Ohio Cooperative Wildlife Research Unit, Ohio State University, Columbus, Ohio.

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of the rabbits were collected. The plants the rabbit had eaten were determined by histological identification of the particles of plant epidermis which were found in the pellets. Nearly 200 samples were collected. Therefore the project required much time to be spent in making microscopic analyses. As a result, eyestrain problems were encountered. The micro-viewing apparatus was designed primarily as a means for reducing them.

The pellet samples each consisted of fine particles of plant tissue. These were mounted on a microscope slide under a coverglass so that they could be viewed using transmitted light. The method of analysis was to view each particle on the slide, identify the material, and record the determination.

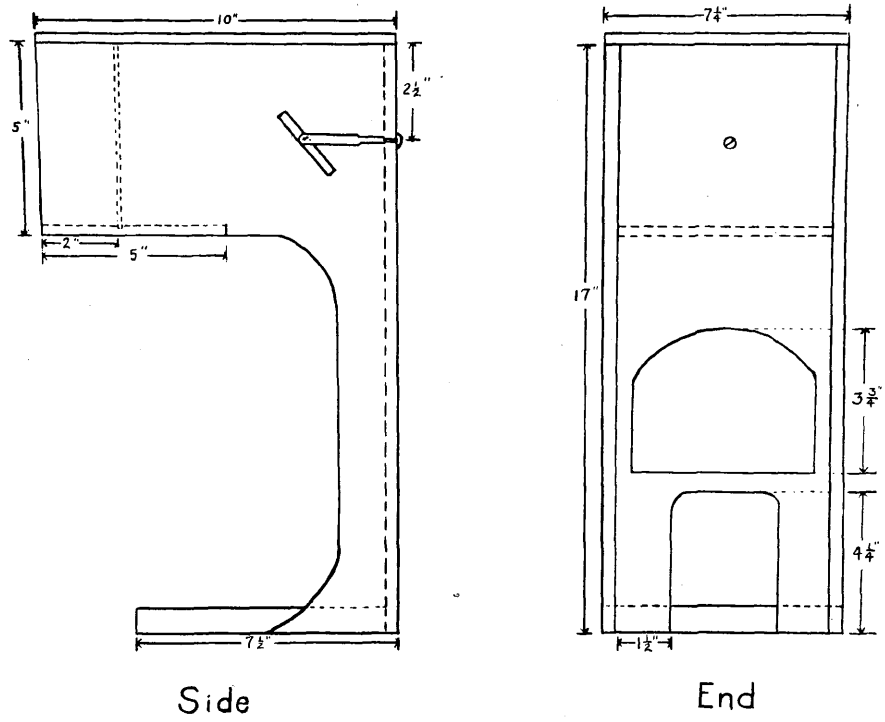

FIGURE 2. Drawing of the micro-viewer.

To do this, a mechanical microscope stage was used for orientating the material. Approximately one-half hour was required for each sample. Both monocular and binocular compound microscopes were used. In each case severe eyestrain resulted after working for more than an hour. The eyestrain was caused chiefly from the accommodation necessary in the frequent upward and downward focusing of the microscope. Eyestrain from use of the monocular microscope was more severe than that resulting from use of the binocular microscope.

The need for a means of avoiding this eyestrain was felt early in the project. It was reasoned that if the image were projected upon a plane surface, the strain of accommodation would be eliminated, since the eyes could focus on that single plane only, regardless of whether the image was in focus. This would also allow binocular vision.

The micro-viewing apparatus designed was very simple. The image from the ocular of a monocular compound microscope was reflected at right angles by a

microscope mirror mounted above it. The image reflected from the mirror was directed upon a 5 inch x 7 inch ground-glass. The opposite side of the ground-glass was the viewing screen. This apparatus was mounted in a housing so that a person seated in front of the viewer could sit in an upright position and manipulate the viewer with ease (figs. 1 and 2).

The only other necessary apparatus was a good research microscope lamp such as used in photomicrography, and a rheostat for controlling the intensity of illumination.

It is realized that many refinements could be made in this viewer, such as substituting a prism for the microscope mirror and a less granular screen in place of the ground glass. The latter would be necessary if analyses were being made that required extremely good definition. Use of this viewer reduced eyestrain sufficiently to permit work periods to be lengthened greatly.

Although this micro-viewer was designed to solve the eyestrain problems encountered in food habits research, there are other applications for which it would seem quite valuable. It would seem quite useful for demonstrating microscopic specimens to a small group of students. In many instances it would be more valuable than a comparison eyepiece for instructional purposes. In situations where a limited number of microscopes are available, this device might be an aid in increasing the number of students per microscope. Undoubtedly if the reader does much microscopic work, he will be able to apply this micro-viewer to many other situations.